USB Type-C ENGINEERING CHANGE NOTICE

Title: Require Higher Power BC 1.2 Sinks to implement Sink Power Sub-State
Applied to: USB Type-C Specification Release 2.0, August 2019

Brief description of the functional changes proposed:

Require USB Type-C BC 1.2 sinks that can consume > Default USB Power to also monitor CC for vRd and implement Sink Power Sub-States.

Benefits as a result of the proposed changes:

Ensures consistent behavior of BC 1.2 capable USB-C sinks when partnered with USB-C supplies, whether the USB-C power supply advertises BC 1.2 or not.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:

Existing revisions of USB Type-C Spec already contain language that Sink Power Sub-States are required if a sink wants to consume more than default USB current. This additional text makes it clear that if a sink implements the optional BC 1.2 functionality in order to satisfy a power demand of > Default USB, that it is not exempt from the Sink Power Sub-State requirement.

An analysis of the hardware implications:

On sink designs that consume <= Default USB power and use BC 1.2 detection, no hardware changes are necessary, and monitoring on CCs is not required.

On sink designs that consume > Default USB and use BC 1.2 detection, they must also have hardware that monitors CC for vRd, if not already designed with CC monitoring in mind.

An analysis of the software implications:

On devices that consume > Default USB power and contain a CC detection circuit as well as BC 1.2, the vRd information must be used in the device's power limiting determination in software. It is not acceptable for the software to rely solely on the BC 1.2 detection.

An analysis of the compliance testing implications:

Extra attention should be paid to devices that sink > Default USB Power and claim BC 1.2 function. If they do not follow the Sink Power Sub-States, they would consume less power than expected from a higher power source (1.5A or 3.0A capable) that does not have BC 1.2 on D+ and D-.

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Actual Change Requested

(a). Section 4.6.2.2 USB Battery Charging 1.2, Page 220

Additional Text:

A Sink that supports BC 1.2 detection and has a maximum current draw greater than Default USB Current shall monitor vRd on the CC pins to detect the Source's Rp and shall implement Sink Power Sub-State transitions (Figure 4-19). If a Sink that supports BC 1.2 detection and has a maximum current draw greater than Default USB Current detects Rp at USB Type-C Current of 1.5A or 3.0A levels but does not detect a BC 1.2 source, it shall limit its maximum current consumption to the appropriate USB Type-C Current level advertised, and shall adjust its current consumption to remain within the value advertised by the Source on Sub-State transitions. For Sub-State transitions starting from a higher power level and ending at a lower power level, the sink shall reduce power consumption within tSinkAdj. See Sections 4.5.2.3.2.2 and 4.5.2.3.3.2.